UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

IP CO., LLC, d/b/a INTUS IQ,	)	
	)	
Plaintiff,	)	CIVIL ACTION FILE
	)	
v.	)	NO. 2:09-cv-37-DF
	)	
DATAMATIC, LTD., EKA SYSTEMS, INC., SENSUS USA INC., TANTALUS SYSTEMS CORP., and TRILLIANT NETWORKS, INC.,	)	
	)	
Defendants.	)	
	)	

SENSUS USA INC.'S RESPONSIVE MARKMAN BRIEF

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I. Introduction

IPCO argues in its opening brief that with the exception of the § 112 ¶ 6 terms, ***none*** of the other disputed claim terms require construction, and that they can be left to their ordinary meaning.[1] However, "the court's obligation is to ensure that questions of the scope of the patent claims are not left to the jury. In order to fulfill this obligation, the court must see to it that disputes concerning the scope of the patent claims are fully resolved."[2]

As the Federal Circuit emphasized in *Phillips v. AWH Corporation*,[3] the Court's construction should be consistent with the specification and a full understanding of what the inventors actually invented:

> [u]ltimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claims. The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction.[4]

Phillips v. AWH Corp. further instructs that the Court's construction should also consider the prosecution history in determining the meaning and scope of the claims. [5]

Sensus's proposed constructions for the disputed claim terms rely primarily on this intrinsic evidence. IPCO's proposed constructions, on the other hand, disregard the intrinsic evidence and broaden the scope of the claimed invention beyond that disclosed in the specification, and are inconsistent with positions taken by IPCO during prosecution of the IPCO patents, including the reexamination of the parent to the asserted patents.

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[1] *See* IPCO's Opening Br. at 7–27; *see also id.* at 4–5.

[2] *Every Penny Counts, Inc. v. Am. Express Co.*, 563 F.3d 1378, 1383 (Fed. Cir. 2009) (citing *O2 Micro Int'l, Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1361−62) (Fed. Cir. 2008)).

[3] 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

[4] *Id*. at 1316.

[5] *Id.* at 1316−17.

II. The IPCO Patents-in-Suit

The IPCO patents-in-suit have a common specification and stem from and claim priority to United States Patent No. 6,044,062, filed on December 6, 1996.[6] The '062 patent was the subject of a reexamination proceeding initiated in 2006 that resulted in final rejections by the PTO in 2008.[7] IPCO appealed the final rejection to the Board of Patent Appeals and Interferences, and on March 16, 2010, the PTO filed its response to IPCO's appeal brief.[8] The reexamination history of the '062 patent is particularly relevant in this case, because IPCO took positions during reeexamination that are inconsistent with its proposed claim constructions in this case and in fact, support Sensus's proposed constructions.[9]

The IPCO patents disclose, and the asserted claims require, a very specific way of optimizing the routing of packets[10] between clients and a server in a wireless radio network that utilizes a client-server architecture. The IPCO patents teach that the claimed invention optimizes routing by reducing the number of "hops" used to transmit a packet.[11] To optimize packet routing in this way, IPCO's patents disclose that the server receives from each client information

[6] IPCO has accused Sensus of infringing U.S. Patent No. 6,249,516 claims 1−4, 6 and 15 (Ex. 1) and U.S. Patent No. 7,054,271 claims 1–3 and 8 (Ex. 2).

[7] On July 21, 2006, a third-party filed a request for reexamination of U.S. Patent No. 6,044,062 claims 1-3, 5-7, 9-11, and 13-15, asserting these claims were unpatentable under 35 U.S.C. §§ 102 and 103 based on Jubin, alone and/or in combination with other prior art references. (*See* Ex. 5, at 4−48.) The PTO granted the request on August 3, 2006, finding a substantial new question of patentability. (Ex. 6, at 1−7.) The PTO later issued initial and final office actions on November 19, 2007 (Ex. 7) and August 13, 2008 (Ex. 9), rejecting the '062 patent claims based on Jubin, which IPCO had responded to on January 22, 2008 (Ex. 8) and October 14, 2008 (Ex. 10), respectively.

[8] On March 16, 2009, IPCO appealed the PTO examiner's final rejection by filing an appeal brief with the PTO's Board of Patent Appeals and Interferences (BPAI) (Ex. 11). The PTO examiner responded to this appeal brief on March 16, 2010 (Ex. 12). At present the '062 patent still stands rejected pending resolution of IPCO's appeal.

[9] "When multiple patents derive from the same initial application, the prosecution history regarding a claim limitation in any patent that has issued applies with equal force to subsequently issued patents that contain the same claim limitation." *See Jonsson v. The Stanley Works*, 903 F.2d 812, 817–818 (Fed. Cir. 1990). ("Wicker Decl.")

[10] A packet is a unit of data in a packet-switched network. *See* Ex. 23, Declaration of Stephen Wicker, at ¶¶ 20−21; *see also id.* at ¶¶ 17−36 for further description of a packet-switched network.

[11] A "hop" is determined by the number of clients that a packet must pass through before it arrives at the server. If the packet originates in Client A and the packet is delivered from Client A to the server, there is only one "hop." If the packet originates in Client C and the packet is delivered from Client C to Client B to Client A to the Server, there are three "hops."

identifying the optimal transmission path from the client to the server, and maintains this information in a map or tree that stores these optimal paths for all of the clients in that network.

A. Prior Art Packet-Based Wireless Radio Networks Optimized the Routing of Packets

As IPCO acknowledges in the "Background Art" section of the IPCO patents, wireless packet radio systems, such as the Ricochet system and the military's DARPA packet radio network (PRNET), were known in the prior art.[12] The Ricochet system combined a radio modem with a personal computer, which could transmit packets to a centralized server. According to IPCO, the Ricochet system did not optimize the routing of packets.[13]

The prior art PRNET system, on the other hand, did optimize the routing of packets.[14] Indeed, a 1987 paper, titled "The DARPA Packet Radio Network Protocols" by Jubin and Tornow, described the DARPA PRNET system as a packet-based wireless network system that optimized network routing by minimizing the number of hops used to transmit a data packet from one packet radio to another packet radio:[15]

> The goal of the tier table is always to ***maintain the "best" information*** about how to get to a destination packet radio. ***The "best" route is currently defined as the shortest route*** with good connectivity on each hop.

(Ex. 3, at 24.) Jubin also described the PRNET network as being dynamic, such that changing conditions and other factors might influence the "optimal" route and require the tier tables to be updated. These other factors included the quality of radio links between network nodes, the mobility of nodes in a network, network congestion, and node failures:

> We have described the algorithms and illustrated how the PRNET provides highly reliable network transport and datagram service, by ***dynamically***

[12] *Id.*, at 2:4−2:65; 3:17-4:38. (Ex. 1).

[13] *Id.*, at 2:4−2:65 (Ex. 1).

[14] *Id.*, at 3:17-4:38 (Ex. 1)

[15] *See generally* Ex. 3 (Jubin reference); Ex. 4 at, *e.g.*, 1−11 (Sensus's P.R. 3-3 claim chart for the Jubin reference).

> ***determining optimal routes***, effectively controlling ***congestion***, and fairly allocating the channel in the face of ***changing link conditions, mobility, and varying traffic loads***.[16]

Because prior art such as Jubin disclosed optimizing packet routing based on the number of hops, IPCO had to distinguish and narrow its alleged invention to the particular client-server system disclosed and claimed by the IPCO patents. In fact, during reexamination of the '062 patent, the PTO rejected the '062 claims because Jubin disclosed such optimization.[17] In order to overcome this prior art rejection, IPCO repeatedly argued that its claimed invention was a ***client-server*** system, while Jubin was a peer-to-peer system:

> Patent Owner respectfully submits that rather than relating to a client-server network, Jubin relates to what was commonly referred to at the time as a ***"peer-to-peer"*** network. Thus, the rejection statement has misinterpreted Jubin and/or the claims of the Brownrigg patent.[18]

In addition, IPCO amended the '062 patent claims to recite a "server process" in an attempt to distinguish its invention from the peer-to-peer system disclosed in Jubin.[19]

Jubin clearly discloses a system that optimizes network routing by minimizing the number of hops used to transmit a packet. Figure 2 of Jubin shows an exemplary PRNET network having five packet radio nodes: L, M, N, O and P.[20] Each packet radio has a "tier" table that identifies (1) each packet radio in the network; (2) the number of hops from the radio to another radio, referred to as the "tier" of the destination node; and (3) the "neighbor" radio that a packet should be sent to next in order to minimize the number of hops used to transmit the

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[16] Ex. 3, at 21 (abstract); *see also* Ex. 4, at 7−10 (citing other parts of Jubin related to routing optimization, including least-hops routing and other factors).

[17] Nov. 19, 2007 Office Action in SN 90/008,011, at 2−26 (Ex. 7); Aug. 13, 2008 Office Action in SN 90/008,011, at 2−33 (Ex. 9).

[18] Jan. 22, 2008 Resp. to Office Action in SN 90/008,011, at 2, 5−6 (Ex. 8) (emphasis added); *see also id.* at 6−9.

[19] Oct. 14, 2008 Resp. to Final Office Action in SN 90/008,011, at 2−28 (Ex. 10)

[20] Ex. 3, at 22; *see also* Ex. 4, at 1−7.

packet to a destination.[21] Figure 5 shows such a "tier" table for node N of the network. Figures 2 and 5 are both reproduced below.

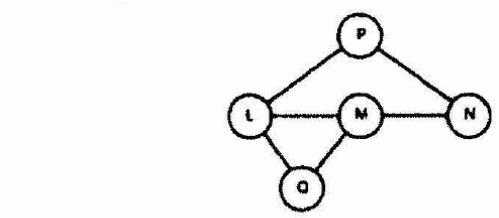

Fig. 2. Small packet radio network.

TIER TABLE

Destination PR	Next-PR in Route	Tier
N	N	0
M	M	1
P	P	1
L	M	2
Q	M	2

Fig. 5. Typical tier table for PR *N*.

As shown in Figure 2, node N is one hop away from nodes M and P, and two hops away from nodes L and Q. Therefore, node N's tier table shown in Figure 5 states that nodes M and P are at tier "1" (*i.e.*, 1 hop away from N), and that nodes L and Q are at tier "2" (*i.e.*, 2 hops away from N).[22] The tier table discloses that to optimize packet routing, node N should transmit any packets destined for nodes M, L, or Q to node M, which is the most direct route from node N to nodes M, L, or Q. (*Id.*) The table also requires that node N transmit packets destined for node P directly to node P. (*Id.*) As a packet is transmitted from node to node, each node will similarly refer to its own tier table and, based on the packet's ultimate destination, determine the next node to send the packet to so that the packet is sent by the most direct path to that destination. (*Id.*)

Because the DARPA PRNET system optimized routing by minimizing the number of hops, IPCO had to distinguish Jubin on the basis of the client-server architecture. Indeed, on appeal, IPCO again argued that the client-server architecture of its invention distinguished it from Jubin's peer-to-peer system:

> Jubin fails to disclose or render obvious at least the recited 'server including a server controller … implementing a controller process' and 'a plurality of clients each including a client controller … implementing a controller

[21] Ex. 3, at 24; *see also* Ex. 4, at 7−10.

[22] *Id.*

> process' at least because ***Jubin relates to a peer-to-peer network, rather than a client-server network.*** … Applicant uses the term 'peer-to-peer network' in a purely descriptive fashion to emphasize that the packet radios in Jubin's network operate within the network as functional equals, and thus, there is no relative hierarchy between the packet radios."[23]

IPCO also emphasized to the PTO that in Jubin, packet radios were "functional equals" because "they did not receive optimized transmission path information from a server that maintains a client link tree or map of the optimized transmission paths of each of the packet radios." (*Id.* at 27.) Instead, "routing in the PRNET is done by having each PR maintain knowledge of the best PR to forward packets to [in] every prospective destination." (*Id.*) IPCO further argued that because there was no single server storing a map of the *entire* network's optimal transmission paths, Jubin's peer-to-peer system was inefficient, communicated too many network messages, and could not support nearly as many nodes as IPCO's client-server system.[24] IPCO also submitted a declaration from its expert, Mr. Joseph McAlexander, arguing the fundamental differences between IPCO's client-server system and Jubin's peer-to-peer system.[25] Thus, IPCO also took positions during reexamination that are inconsistent with its claim construction positions for "map of data packet transmission paths" and "in-memory [internal memory] routing tree link information" and that support Sensus's proposed constructions.

B. The Alleged Improvements Of IPCO's Patents: A Client-Sever System And Maps Of Optimal Network Routes

Thus, according to IPCO, its patents allegedly improved on the prior art by disclosing a ***client-server*** system for optimizing wireless packet radio network routing[26] by minimizing the number of hops. This system is illustrated by Figures 1, 1a and 1b of the IPCO patents:

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[23] IPCO's March 16, 2009 Appeal Br. Under 37 C.F.R. § 41.37 (Ex. 9) at 26 and n.3.

[24] *See id.* at 27−32; *see also* Oct. 14, 2008 Resp. to Final Office Action in SN 90/008,011, at 18−20 (Ex. 8)

[25] *See* May 17, 2010 McAlexander Decl. in SN 90/008,011, at ¶¶ 11−23 (Ex. 22). Mr. McAlexander emphasized that the server "maintains a client link tree having client link entries," unlike Jubin's peer-to-peer system. (*Id.* ¶ 19.)

[26] '516 patent at, e.g., abstract and 4:66−6:29 (Ex. 1).

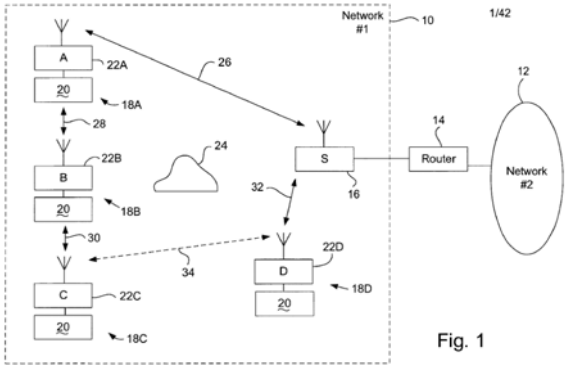

Fig. 1

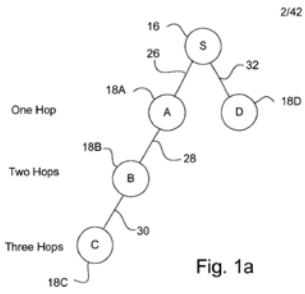

Fig. 1a

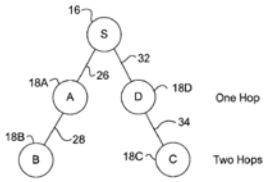

Fig. 1b

In Figure 1, a wireless network #1 (10) is formed by a server S (16) and a plurality of clients A (18A), B (18B), C (18C), and D (18D).[27] Server S also acts as a gateway by connecting wireless network #1 to a second network #2 (12), through router 14.[28] Server S stores a map of the network tree routing information that identifies the different, optimal communication paths between from clients A, B, C and D to the server S.[29] This routing tree information is illustrated by Figures 1a and 1b that, like Figure 1, show the communication paths between server S and clients A, B, C and D.[30]

In the wireless network 10, each client is one or more "hops" away from another client or from the server.[31] In Figure 1a, each of the following is a single "hop": link 30 from client C to client B; link 28 from client B to client A; link 26 from client A to server S; and link 32 from client D to server S. If a client is only one hop away from another client or server, the client has a direct, one-hop route to the other client or server.[32] Clients A and D each have a direct, one-hop route to server S. If, on the other hand, a client communicates with another client or the server through one or more additional clients, then the client is said to have an indirect, multi-

[27] *See generally id.* at 7:62−8:53.

[28] *Id.* at 7:64−66.

[29] *Id.* at 5:50−6:7 and 8:43−48; *see also id.* at 15:43−17:14 and Figs. 6b−9c.

[30] *Id.* at 9:54−10:16.

[31] *Id*. at 4:66−5:18.

[32] *Id.* at 9:54−10:16.

hop route to the other client or server. *Id.* Client C has an indirect, three-hop route to server S (C→B→A→S); client B has an indirect, two-hop route to server S (B→A→S).

To optimize packet routing, IPCO's patents teach that the number of hops used to transmit a packet should be minimized. (*Id.* at 5:11−16.) For example, client C may determine that it can also communicate with server S through client D, which would be an indirect, two-hop route (C→D→S) as shown in Figure 1b. This path is shorter, and hence preferable, to client C's three-hop route in Figure 1a. As a result, client C informs the server S it will communicate through this indirect, two-hop route (C→D→S) of Figure 1b, instead of through the indirect, three-hop route shown in Figure 1a (C→B→A→S). (*Id*. at 10:1-9)

To optimize packet routing in this way, IPCO's patents disclose that each client examines the header of each packet received from another client or from the server to determine the number of hops the packet traversed to reach the recipient client.[33] If the number of hops traversed by the received packet is less than the current optimal path to the client, then the client notifies the server that the client has identified a new optimal path having less hops to the server.

The server receives from each client this information identifying the optimal, least-hops path from the client to the server, and maintains this information in a map that stores the routing tree link information for all of the network clients.[34] This routing tree link information identifies the optimal path from the server to each client.[35] As transmission path conditions change, the server sends updated path information to the clients, so that each client will know the optimal,

[33] *Id.* at 21:1−54 and Fig. 18.

[34] *Id.* at 5:50−6:7; 8:43−48; 15:43−17:14 and Figs. 6−9c.

[35] *Id.*; *see also* Oct. 14, 2008 Resp. to Final Office Action in SN 90/008,011, at 16−17 (Ex. 8) ("The clients implement a client process that selects a best transmission path to the server and that transmits the best transmission path to the server. The server, in turn, implements a server process that … maintains a client link tree, or network map of the client-to-server transmission paths, including client link entries corresponding to an optimized transmission path for each of the clients of the network to the server.")

least-hops routes from the clients to the server.[36]

III. Disputed Claim Terms[37, 38]

A. "Client", "Gateway and "Server"

Sensus's Position	IPCO's Position
Client: An equipment, program, and/or device that requests and receives a service from a server. Server / Gateway: An equipment, program, and/or device that receives client requests and provides a service to a client, but is not itself a client.[39]	Claim construction is unnecessary. Alternatively: Client: An equipment, program, and/or device that is capable of communicating with or using a service from at least one server or another client. Server: An equipment, program, and/or device capable of providing a data, digital, or electronic service to clients. Gateway: An equipment, program, and/or device that facilitates communication between two networks.

As discussed above, IPCO distinguished its claimed invention from prior art such as Jubin on the basis that IPCO's system is a *client-server* system, and not a peer-to-peer system like Jubin. The specification expressly notes this difference, stating that that in some networks, "one or more network 'servers' or 'hosts' will influence data flow within the network and access to certain network functions … ; [o]ther local area networks operate on a peer-to-peer basis without the use of servers."[40,41] IPCO's proposed constructions for "client" and "server" do not

[36] Oct. 14, 2008 Resp. to Final Office Action in SN 90/008,011, at 17 (Ex. 8).

[37] In effort to narrow the issues in dispute, Sensus agrees that the following claim terms do not need to be construed at this time, and has not briefed them herein: (i) "Network interface"; (ii) "Transmission path"; (iii) "Changing [changes] the transmission path"; (iv) "Digital controller"; (v) "Translates data packets"; and (vi) "Router." Many of these terms and their constructions were originally proposed by Defendants Eka or Trilliant, who have since settled with IPCO. By agreeing that these terms do not require construction, Sensus does not concede that it agrees with IPCO's alternative constructions of these terms or how these terms are used in the patent. Should it become apparent from IPCO's expert report that there is a dispute with respect to any of these terms, Sensus will seek the appropriate relief from this Court.

[38] Sensus agrees to IPCO's proposed construction of the following "means" terms: (1) "Means for converting said data packet to a format used in said second network"; (2) "Means for converting said data packet to a format used in said wireless network"; (3) "Means for receiving a data packet from a client of said wireless network"; (4) "Means for transmitting said data packet from said second network"; (5) "Means for sending said data packet to a proper location on said second network" and (6) "Means for transmitting said data packet with said header to a client of said wireless network."

[39] Sensus has modified its proposed construction of "gateway" from its earlier proposal in the P.R. 4-3 filing.

[40] '516 patent at 1:19–25; *see also id.* at 3:10–16 (describing prior art ham radio networks as "peer-to-peer" networks where "each peer repeats all data packets that it receives, resulting in rapid packet proliferation").

accurately reflect the distinction drawn by the specification. Further, as discussed above, the proposed constructions do not reflect the distinction drawn by IPCO, during the '062 reexamination, to overcome a prior art peer-to-peer system, where each packet radio determines its own routing information.[42]

Sensus's proposed construction, on the other hand, accurately reflects the requirements of a client-server system: there must be distinct "clients" that request a (routing) service from a server, and distinct "servers" that provide that (routing) service but are not, themselves, clients.[43] In particular, Sensus's proposal accurately reflects that a system such as Jubin, where every network node is a "peer" that maintains its own routing table, and that does not send routing information to or request routing information from a server tasked with maintaining the network's routing information, is not a client-server system.

"Gateway" should be given the same construction as "server" because the specification teaches that the server and gateway are the same component, with the server acting as a

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[41] Dr. Brownrigg's 1987 book, *Packet Radio Networks*, also calls out this distinction of peer-to-peer networks, stating in a section titled "Uniformity of Nodes," "One of the keys in designing a packet radio system is whether the system is composed of homogeneous or heterogeneous components. For example, are all nodes functionally equivalent, as in a peer-to-peer (computer-to-computer) network? Or is the network primarily intended to connect a population of terminals to one or more hosts, perhaps through specialized base stations?" (Ex. 13, at 4.)

[42] "When multiple patents derive from the same initial application, the prosecution history regarding a claim limitation in any patent that has issued applies with equal force to subsequently issued patents that contain the same claim limitation." *See Jonsson v. The Stanley Works*, 903 F.2d 812, 817–18 (Fed. Cir. 1990). As a result, the prosecution history of a parent application, and related patentability arguments, are part of the intrinsic record and apply to related children applications. *See id.*; *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 979–80 (Fed. Cir. 1999); *Goldenberg v. Cytogen, Inc.*, 373 F.3d 1158, 1166–68 (Fed. Cir. 2004); *Mark I Mktg. Corp. v. R.R. Donnelley & Sons Co.*, 66 F.3d 285, 289–92 (Fed. Cir. 1995); *Masco Corp. v. United States*, 303 F.3d 1316, 1324–26 (Fed. Cir. 2002). Further, the prosecution history file wrapper and intrinsic record includes any reexamination proceedings before the PTO and applicant arguments made during reexamination. *E.g.*, *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861, 867–70 (Fed. Cir. 2004); *Beneficial Innovations, Inc. v. Blockdot, Inc.*, No. 2:07-CV-555, Dkt. No. 264, at 3 (E.D. Tex. June 3, 2010) (*citing CVI/Beta Ventures v. Tura LP*, 112 F.3d 1146, 1158 (Fed. Cir. 1987)). As a result, the '062 patent reexamination and IPCO's arguments distinguishing Jubin are part of the intrinsic record, and apply with equal force to the '516 and '271 child and grandchild applications.

[43] Sensus's proposal is also consistent with the ordinary technical definitions of "client" and "server." Newton's Telecom Dictionary defines a "client" as: "[D]evices and software that request information. Clients are objects that uses [sic] the resources of another object" (Ex. 14, at 132); and a "server" as: "[A] shared computer on the local area network … . [I]t may be used as a repository and distributor of oodles of data. It may also be the gatekeeper controlling access to voice mail, electronic mail, [and] facsimile services." (*Id.*, at 537−38.)

gateway.[44] This is consistent with claim language: '516 patent claim 1 recites "a server providing a gateway …,"[45] and '516 patent claim 15 recites "a gateway between two networks" that maintains the map of optimal transmission paths between clients and the gateway.[46]

B. "Map [of data packet transmission paths]" and "In-memory [internal memory] routing tree link information"

Map [of data packet transmission paths]	
Sensus's Position	**IPCO's Position**
Data structure storing the complete set of optimal transmission paths between each client and a server (claim 1)/gateway (claim 15)	Claim construction is unnecessary. The plain and ordinary meaning controls. Alternatively, "data structure containing a representation of one or more transmission paths."

In-memory [internal memory] routing tree link information	
Sensus's Position	**IPCO's Position**
Information stored in computer memory identifying the optimal route between a client and a server, where this optimal route is part of a complete set of optimal routes between all clients and the server.	Claim construction is unnecessary. The plain and ordinary meaning controls. Alternatively, "data structure resident on computer memory relating to links among or between clients and/or one or more servers."

The claim terms "map of data packet transmission paths" and "in-memory routing tree link information" are related. As explained in the IPCO patents, and described above,[47] the server or gateway of the claimed invention stores a "map" or "tree" of the optimal transmission paths between each client and the server in the *entire* network, *i.e.* a complete set of optimal transmission paths from each client in the network to each server in the network.[48] For example, Figure 1b of the IPCO patents shows the "map" or "tree" of the optimal transmission paths[49] for

[44] '516 patent at, *e.g.*, 5:50−6:7; 7:62−8:16 and Fig. 1 (server S).

[45] *Id.* at 23:30−22.

[46] *Id.* at 25:47−53 and 25:56−26:23.

[47] *See* Section II.B.

[48] '516 patent at 5:66−6:7; 8:43−48; and 9:55-56; *see also id.* at 15:43−17:14 and Figs. 6b−9c.

[49] Links are described as paths to the server. *See* '271 patent, abstract ("*The client process of each of the clients initiates, selects, and maintains a radio transmission path to the server that is either a direct path to the server, **or is an indirect path or "link" to the server** through at least one of the remainder of the clients*".) (emphasis added). These links are represented as tree structures. *Id.* at 9:54-58 ("*In FIGS. 1a and 1B, two **"tree" structures are shown illustrating the various links** that were discussed, by way of 55 example, with reference to FIG. 1. The tree structure*

an entire network consisting of clients A, B, C, D and server S, *i.e.* complete set of optimal transmission paths: one from client A to server S, one from client B to server S, one from client C to server S and one from client D to server S.

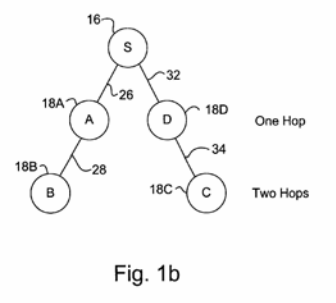

Fig. 1b

Dr. Wicker explains in his declaration that one of ordinary skill would understand that a tree is a particular type of graph in which there is exactly one path between any two distinct paths on the graph.[50] IPCO's patents are consistent with this understanding and describe a "tree" as having exactly one such path between each client and the server.[51] This "map" or "tree" is further described in the IPCO patents as having the complete set of optimized network path information from each client to the server or gateway.[52]

IPCO's proposed constructions, however, read out the tree-like nature of the map and routing tree, including that the map and routing tree information is comprehensive and for the *entire* network. In making this fundamental error, IPCO again fails to mention its statements to the PTO during the '062 patent reexamination, where it argued Jubin's tier tables "were not a client link tree having client link information."[53] IPCO rejected the PTO's assertion in the

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is maintained in the server S, and is transmitted to any client that may request it.").

[50] Wicker Decl. at ¶¶ 76−80 (Ex. 23).

[51] *See* '271 patent at Figs. 1a−2n and 9:59−11:51.

[52] *See id.* at 5:66−6:7; 13:36−44 (discussing that the server "updates the tree" if it determines that a path received from a client is not the same as stored by the server); 14:51−53 (discussing transmission of "the network tree" to a requesting client); 15:43−16:44 (discussing server processes to add and delete clients from the network tree).)

[53] Jan. 22, 2008 Resp. to Office Action at 9−10 (Ex. 6).

preceding office action that Jubin's tier tables, which only included partial routing information vis-à-vis the next hop to transmit a data packet, was a "tree."[54] In its BPAI Appeal Brief, IPCO similarly disclaimed Jubin's tier table as a routing tree:

> Further, since the Jubin tier tables include only information regarding the number of hops to the destination packet radio and the next packet radio enroute, they are ***not*** 'client link trees having client link entries.' The Brownrigg patent's client link trees include information about ***all of the clients on the path between the transmitting client and the server.***[55]

IPCO's proposed constructions do not reflect its statements and disclaimers to the PTO about the specific requirements of the routing tree structure and the server/gateway map.[56]

As explained above, the claim terms "map of data packet transmission paths" and "in-memory routing tree link information" are related. However, the term "in-memory routing tree link information," when used in '271 patent claim 1, refers not to the entire routing tree, but only to the optimal transmission path between a client and the server, *e.g.*, the optimal route from client A to server S. This routing tree link information is stored in the client, but it is also sent to and stored by the server as part of the "routing tree" or "map" of optimal routes for all clients. Thus, Sensus's proposed construction of "in-memory routing tree link information" accounts for the '271 claims' use of this term to identify the information stored in the client as well as the information stored in the server.

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[54] *See id.*; *see also* Oct. 14, 2008 Resp. Final Office Action at 16-17 (stating that clients select the best transmission path to the server, and "[t]he server, in turn … maintains a ***client link tree, or network map of the client-to-server transmission paths*** … ," which is dynamically updated with "the best transmission path information") (Ex. 8).)

[55] March 16, 2009 Appeal Brief Under 37 C.F.R. § 41.37, at 34 (Ex. 9); *see also id.* at 26−27, 29, 31-32; 34−35.

[56] IPCO also relied on the fact that each node in Jubin only had partial routing information in the tier table—rather than the complete routing information for the entire wireless network—as a basis to argue that Jubin did not disclose a server (or a client-server system) as required by the IPCO patents.

C. "Optimize the transmission paths" ('516 patent claims 1, 6 and 15)

Sensus's Position	IPCO's Position
Select the best path for communicating a data packet from a client to the gateway.[57]	Claim construction is unnecessary. The plain and ordinary meaning controls. Alternatively, "improve the transmission paths"

The claim term "optimize the transmission paths" should be construed because the parties dispute whether "optimization" requires selection of the best transmission path versus the selection of a better or improved—but not the optimal—path. According to the claim language, when performing least-hops optimization, the optimal path is "through ***the least possible number*** of additional clients,"[58] which is consistent with the specification's definition of "optimization":

> The process of the present invention preferably includes an optimization process which ***minimizes the number of hops from the clients to the servers***, on the theory that the fewer the number of hops, the better the performance of the network.

(*Id.* at 5:11−16; *see also id.* at abstract; 8:66−9:11; 8:54−10:9 and Fig. 1b.) The specification further states that a route is not "optimal" if it includes more hops than necessary:

> In FIG. 2j, a client 29 is finding a route to the server via one of its neighbors. It finds a route through client 19, … and the route from user client 29 to the server is determined. However, ***this route is not an optimal route in that it includes a greater number of hops than necessary***.[59]

Thus, "optimization" does not result in an "improved" path as IPCO argues, but the best available path, as the claim language and specification state.

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[57] Because '516 patent claims 1, 6 and 15 facially recite four different choices to "optimize the transmission path," this term in these claims simply means to select the best path, depending on which choice is used—e.g., for least-hops routing optimization, selecting the path having the fewest hops. However, '271 patent claim 1 does not similarly recite different optimization choices, and the patent specification only supports least-hops routing optimization. As a result, the claim term "optimal route" in '271 patent claim 1 means the least-hops route, unlike the facially similar term "optimize the network pathways" in the '516 patent claims.

[58] '516 patent at 23:47−50. The '516 patent claims also recite that, alternatively, "to optimize the transmission paths," the path must be through the ***"most"*** robust additional clients (not just "more" robust); through the ***"fastest"*** clients (not just "faster"); and through the clients with the ***"least"*** amount of traffic (not just "less" amount). ('516 patent at 23:50−53). Thus, the claim language consistently requires the "best" path, not merely a "better" path.

[59] *Id.* at 11:65−12:4; *see also id.* at 12:23−31 and Fig. 2n (referring to client 29 "optimizing its path" by eliminating client 18 from its route, which results in "the shortest possible 3 hop path to server 26.").

D. "Instructions for analyzing a data packet to determine if the data packet has been sent on a new optimal route unknown to the client" and "optimal route" ('271 patent claim 1)[60]

Sensus's Position	IPCO's Position
Computer code for determining the number of hops for a network path used to communicate a data packet between a client and server, and for determining whether this network path has fewer hops than the path currently designated as optimal between the client and server.	Claim construction is unnecessary. The plain and ordinary meaning controls. Alternatively, "computer code for determining whether the data packet has been sent on a new better route based on currently-available information, the better route previously unknown to the client."

The parties' dispute regarding construction here is over the breadth of "optimal route" found in '271 patent claim 1. The relevant claim language recites that the "client digital controller" includes "a client program" having instructions for determining a "new optimal route" from the client to the server.[61]

IPCO argues that "optimal route" need not be construed or, alternatively, that it be construed as simply "a new better route based on currently-available information." (IPCO's Opening Br. at 14−16.) This argument ignores the specification's failure to disclose any support for optimization other than least-hops optimization, and renders "optimal route" entirely subjective. The specification discloses only one client program embodiment for determining a new "optimal route"—the route having the fewest hops:

> [O]ptimization occurs when clients 'hear' transmission [sic] from other clients ***that have a better (i.e. shorter) path to a server***.[62]

IPCO purports to rely on other parts of the specification that mention, in passing, other possible alternatives to optimize routing, based on factors such as which clients are fastest, have the least amount of traffic, or are the most robust.[63] But the specification fails to provide any enabling

[60] Resolution of this disputed claim phrase also resolves any dispute regarding the meaning of the claim term "optimal route" found within the phrase.

[61] '271 patent, at 23:38-48.

[62] '271 patent at 11:41−43 (emphasis added); *see also id.* at 5:8−13; 9:66−10:7.

[63] *See id.* at 2:33−3:30; 4:35−44; 5:13−15; 6:15−22; 9:3−22; 12:44−58; and 18:6−16.

description or written support for these other forms of "optimization," and does not describe how a client would perform optimization in these other ways. (*See id.* at 21:4−58.)[64] Under ICPO's proposal, any conceivable mechanism for determining a "better route" would be covered, even though the IPCO patents do not provide written support for or enable every such mechanism.[65]

IPCO's argument that "optimal route" simply means any "better route" also raises definiteness issues under § 112 ¶ 2. For example, assume there are two paths from a client to a server, A and B. Further assume that path A has fewer hops but more client traffic; conversely, path B has more hops but less client traffic. Which path is optimal? The patent plainly teaches that path A, having fewer hops, is optimal. (*See* Ex. 2 at, *e.g.*, 5:8−13.) But under IPCO's subjective, ambiguous "better route" proposal, and its argument that the patent teaches other "optimal" routes such as those having less traffic, path A is not optimal after all. In fact, there is no clear "optimal" path under this simple example, which exposes the inherent definiteness problems caused by failing to construe "optimal route" or by adopting IPCO's nebulous "better route" construction. *See Datamize, LLC*, 417 F.3d at 1347−49, 1356.

The specification discloses only one embodiment for determining a "new optimal route," which is described at Figure 18 and 21:4−58 of the '271 patent. There, the client program "processes received radio packets" by examining the packet header to determine the transmission path of the received packet. If the recipient client is the packet destination, then at step 376, the client program determines if the packet was received through *a shorter link having fewer hops*

[64] The specification must enable the "full scope of the claims." *See Alza Corp. v. Andrx Pharm., LLC*, 603 F.3d 935, 938−43 (Fed. Cir. 2010); *Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 995−1002 (Fed. Cir. 2008).

[65] The principal difference between this construction of "optimal route" in '271 patent claim 1, versus the recited "optimize the transmission path" claim language in the asserted '516 patent claims, is that the '516 patent claims recite that their optimization is chosen from a group consisting essentially of the path having the least client hops, the least client traffic, the fastest clients, and the most robust clients. As a result, while '271 patent claim 1's "optimal route" can be properly construed as limited to least-hops optimization, the '516 patent claims cannot, because they expressly recite other optimization alternatives—even though those other alternatives are not enabled and lack written support in the specification contrary to 35 U.S.C. § 112, ¶ 1.

and, if it was, records this by updating to the shorter link at step 378. (*Id.* at 21:4−14.) If the recipient client is not the packet's final destination, the client performs the "pooning" process in steps 388−392 to determine, similarly, if the packet was sent by a route having fewer hops. (*Id.* at 21:24−38.) If there is a shorter route, the "the client's link is updated in step 392 to this shorter link." (*Id.* at 21:33−34.) As a packet is transmitted from node to node (client-to-client), each node in the transmission path is marked in the packet header, allowing the recipient packet to identify new routes having fewer hops. (*Id.* at 21:39−58 and Figs. 18A and 18B.)

E. "Group consisting essentially of"

Sensus's Position	IPCO's Position
Group having as choices only.	Claim construction is unnecessary. The plain and ordinary meaning controls. Alternatively, "group including but not limited to"

'516 patent claims 1, 6, and 15 recite that when changing client transmission paths to optimize those paths, the optimal path is "chosen from the group consisting essentially of":

1. "the path to the gateway through the least possible number of additional clients";
2. "the path to the gateway through the most robust additional clients";
3. "the path to the gateway through the clients with the least amount of traffic"; and
4. "the path to the gateway through the fastest clients."[66]

The parties dispute whether the claim phrase "chosen from the group consisting essentially of" denotes an open or closed group (or somewhere in between) and, relatedly, whether this phrase is written in "Markush" format.

As an initial matter, IPCO concedes that "consisting essentially of" is not an open ended transition phrase; instead, this phrase only permits "additional elements that do not materially affect the basic and novel characteristics of the invention."[67] Therefore, IPCO's proposal that "group consisting essentially of" mean a "group including but not limited to" is incorrect,

[66] '516 patent at 23:44−53; 24:23−32; and 25:14−23.

[67] IPCO Opening Br. at 11−12 (citing *Ecolab, Inc. v. FMC Corp.*, 569 F.3d 1335, 1343−44 (Fed. Cir. 2009) and MPEP § 2111.03.

because this would be a completely open-ended phrase.

When a claim element is written using the phrase "group consisting of," the claim is recited in so-called Markush format, and the group recited is considered a closed group.[68] In *Abbott Laboratories*, although the patentee had written its claims in Markush format, the patentee argued that the word "a" preceding the phrase "group consisting of" made the group open and permitted other elements and combinations of group members. 334 F.3d at 1280−81. The Federal Circuit disagreed, stating, "If a patentee desires mixtures of combinations of the members in the Markush group, the patentee would need to add qualifying language while drafting the claim. … [W]ithout expressly indicating the selection of multiple members of a Markush grouping, a patentee does not claim anything other than the plain reading of the closed claim language." *Id.* at 1281.

Here, IPCO's claims are written consistent with the Markush format by reciting "a group consisting essentially of" certain group members, and is presumptively closed as a matter of law. *Id.* The only arguable qualifying language recited by the claims is the addition of the word "essentially." Given the Federal Circuit's requirement that the claim expressly recite that mixtures or combinations of group members are permitted to overcome the closed nature of the group—which the claims at issue do not do here—the language "group consisting essentially of" should be construed to remain a closed group for '516 patent claims 1, 6 and 15. *Id.* In the alternative, applying the Federal Circuit's statement in *Abbott Laboratories* regarding the "plain meaning of the claim language," the word "essentially" only permits other group members "that do not materially affect the basic and novel characteristics of the invention."

[68] *See, e.g.*, *Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1372 (Fed. Cir. 2005); *Abbott Labs. v. Baxter Pharm. Prods., Inc.*, 334 F.3d 1274, 1280−81 (Fed. Cir. 2003); MPEP § 2173.05(h) and 803.02.

F. "Dynamically updating [the map of transmission paths]"

Sensus's Position	IPCO's Position
Continuously modifying the map of transmission paths to store a new optimal transmission path from a client to a server.[69]	Claim construction is unnecessary. The plain and ordinary meaning controls. Alternatively, "refreshing or modifying a map of transmission paths as needed."

The parties dispute whether "dynamically updating" refers to continuous modification of the map of transmission paths as clients enter, exit, and move about the wireless network, and as network conditions change, as described by the specification:

> [T]he client listens to all packets to continuously and dynamically update its link to the best possible path.[70]

The specification further states that "the optimization occurs dynamically ***during operation*** and without complex algorithms and look-up tables. As will be discussed in greater detail subsequently, the optimization occurs when clients 'hear' transmission [sic] from other clients that have a better (i.e. shorter) path to a server."[71] Hence, "dynamically updating" refers to the continuous modification of the transmission path map to store new, optimal transmission paths.

Contrary to IPCO's assertion in its opening brief (at 10), Sensus's proposed construction does not import exemplary language from the specification. Although the specification discloses different conditions and processes that cause the transmission path map to be dynamically updated, (*id.* (reciting "pooning," probing a client neighbor, and an "upstream" client changing its route)), Sensus's proposed construction does not exclude any of these ways to dynamically update the map. However, what "dynamically updating" does require—and what is missing from IPCO's alternative proposal—is that the updating is continuous and occurs as network conditions change. As a result, not every refresh or modification of the network map is

[69] Sensus has modified its proposed construction in an attempt to narrow the issues in dispute.

[70] '516 patent at 21:33−35; *see also id.* at 4:39−48; 6:18−25; and 9:35−45.

[71] *Id.* at 11:33−38 (emphasis added); *see also id.* at 12:5−16 and 23−36.

"dynamic," contrary to IPCO's proposal.[72]

G. "Header"

Sensus's Position	IPCO's Position
A portion of a data packet that contains information used to route the data packet through the network including the source address, the address of all hops along the way, and the destination address.	No construction of this term/phrase is necessary at this time. The plain and ordinary meaning controls. Alternatively, "a portion of a packet containing information that may include routing information."

As IPCO admits in its opening brief, in the specification the inventors acted as their own lexicographer by defining the term "header":[73]

> The header 114 includes the source address, the address of all hops along the way (i.e. the "link" of the data packet), and the destination address.

IPCO does not explain what the common meaning of "header" is or why that meaning displaces the inventors' own definition here. To the contrary, the specification emphasizes that the particular header format disclosed is critical to the claimed invention's optimization of wireless network routing by identifying and modifying the least-hops links.[74,75] These specification statements also contradict IPCO's alternative proposal that a header "may" include routing information, which improperly broadens the claimed invention.[76] IPCO's fallback to claim differentiation in support of its construction, by selectively quoting the patent claims out of context, is also ineffective. (IPCO's Opening Br. at 13−14.) '516 patent claim 8 recites the additional limitation of "means for adding a header to the packet including a reverse link and data type …"; '516 patent claim 5 (which does not depend from claim 6, at issue here) adds the

[72] *See* Harry Newton, Newton's Telecom Dictionary at 207 (11th ed. 1996) (Ex. 14) (defining "dynamic" as "events are constantly changing").

[73] '516 patent at 14:19−21 (cited by IPCO Opening Br. at 12); *see also id.* at 21:36−44.

[74] *See id.* at, *e.g.*, 14:31−35; 15:53−60; 21:12−20 and 36−54; and 22:56−23:9.

[75] The definition of "header" in Newton's Telecom Dictionary is consistent, stating it is "[t]he portion of a message that contains information that will guide the message to the correct destination. This information contains things such as the sender's and receiver's addresses, precedence level, [and] routing instructions … ." (Ex. 14, at 287.)

[76] *See also id.* at 4:60−63 ("[T]he data packets of ***the present invention*** also include data routing information concerning the path or "link" from the source of the packet to the destination of the packet within the wireless network."); *see Edwards Lifesciences* 582 F.3d at 1328–30; *Honeywell Int'l, Inc.*, 452 F.3d at 1318.

limitation that the digital controller is the component that adds a header to the data packet. Neither of these claims recite that the header further comprises a reverse link or data type, as required to invoke claim differentiation.

H. "[Operable together via] parallel processing"

Sensus's Position	IPCO's Position
Processing information simultaneously and in a coordinated fashion to perform a single task.	Claim construction is unnecessary. The plain and ordinary meaning controls. Alternatively, "[capable of] performing processes concurrently."

The claim term "parallel processing" appears in '271 patent claim 1, which recites that the server program and client program are "operable together via parallel processing to determine a new optimal route by exchanging in-memory routing tree link information." ('271 patent at 23:49−52). Claim 1 further elaborates that the client program includes instruction for determining the optimal route to the server and notifying the server of the new optimal route, (*id.* at 23:38−48), and that the server program is also "operable for determining an optimal route from the server to the client … ," (*id.* at 23:29−33). This is consistent with the specification, which describes the parallel operation of the client and server programs so that, collectively, the server and clients identify and store the optimal, least-hops routes from clients to servers.[77] This portrayal of coordinated, parallel processing by the specification is consistent with the ordinary meaning of "parallel processing."[78] IPCO's proposed construction, on the other hand, is inconsistent with this meaning and is met simply when two processors are operating concurrently—regardless of the tasks being performed and any coordination or cooperation between the processors. This definition is overbroad and incorrect, and characterizing "parallel

[77] *See generally id.* at 13:43−14:48 and Fig. 5; 21:4−58 and Fig. 18; 22:40−23:20 and Figs 21a−21d.

[78] *See* Jonar C. Nader, Prentice Hall's Illustrated Dictionary of Computing (Prentice Hall 1992), at 339 (defining "parallel processing" as "[t]he use of several processors (nodes or computers) to simultaneously share the calculation/computation of a large task. … Parallel computers … divide the processing task into a series of processors") (Ex. 15).

processing" as merely concurrent processing is contrary to the ordinary meaning of this term.

I. Definiteness Issues

1. "Means for changing the transmission paths of clients to optimize the transmission paths …" ('516 patent claim 6)

Sensus's Position	IPCO's Position
Function: Changing the transmission paths of client to optimize the transmission paths includes [sic] changing the transmission path from the client to the gateway so that the path to the gateway is chosen from the group consisting essentially of the path to the gateway through the least possible number of additional clients, the path to the gateway through the most robust additional clients, the path to the gateway through the clients with the least amount of traffic, and the path to the gateway through the fastest clients. Structure: None disclosed or linked by the specification; indefinite.	Function: Changing the transmission paths of clients to optimize the transmission paths. Structure: A radio modem and microprocessor configured with logic to change the transmission paths and equivalents.

This "means" claim element is the last element of '516 patent claim 6, and is indefinite. The specification does not provide any meaningful guidance, much less disclose any structure or algorithm, for changing the transmission path by choosing a path through the most robust clients, the clients with the least amount of traffic, or the fastest clients.[79] Instead, the specification only discloses and clearly links the client and server programs for changing the transmission path by choosing the path having the least number of hops, which is only one of the four choices of the "means for changing the transmission path" recited by '516 patent claim 6.

IPCO argues the term is definite because the corresponding structure is "[a] radio modem and microprocessor configured with logic to change the transmission paths." (IPCO Opening Br. at 27−28.) But this "structure" does not pass muster under § 112 ¶ 6. First, the specification does not link this structure (or any other structure) to changing the transmission path by choosing a path through the most robust clients, the clients with the least amount of traffic, or the fastest clients. (*See* '516 patent at 9:11−19 (cited by IPCO Opening Br. at 28).) Second, "a

[79] *See* '516 patent at 21:33−35; 4:39−48; 6:18−25; and 9:35−45, *also* Sections III.J.2−IV.J.4, *infra*, discussing definiteness issues with the claim terms reciting the paths to the gateway through the most robust clients, the fastest clients, and the clients with the least amount of traffic.

microprocessor configured with logic to change the transmission path" is not sufficient § 112 ¶ 6 structure as a matter of law: "Because general purpose computers can be programmed to perform very different tasks in very different ways, simply disclosing a computer as the structure designated to perform a particular function does not limit the scope of the claim to 'the corresponding structure, material, or acts' that perform the function, as required by [§ 112, ¶ 6]."[80] The specification must disclose and link a specific algorithm sufficient to perform the recited function.[81] IPCO does not, and cannot, dispute that the specification fails to disclose or clearly link any specific algorithm to changing the transmission path by choosing a path through the clients that are the most robust, the fastest, or have the least amount of traffic. Instead, the specification presents bare assertions that the disclosed, least-hops routing optimization can be modified to account for these other ways to optimize routing—without disclosing what these modifications or the corresponding other routing algorithms would be.[82]

2. "The path to the gateway through the most robust additional clients"

Sensus's Position	IPCO's Position
Indefinite.	Claim construction is unnecessary; the plain and ordinary meaning controls. Alternatively, "the path to the gateway through the most reliable clients or through the clients having the greatest ability to maintain communication under adverse conditions, including but not limited to factors such as signal strength; battery life; link quality; and susceptibility to malfunctions."

This claim phrase is indefinite because there is no plain and ordinary meaning of "path to the gateway through the most robust additional clients," and the specification does not define what this path is or teach how to identify this path.[83] "Most robust" is a term of degree. "When a word of degree is used the district court must determine whether the patent's specification

[80] *Aristocrat Techs. Austl. Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008).

[81] *See id.* at 1336–38; *see also Net MoneyIn, Inc. v. Verisign, Inc.*, 545 F.3d 1359, 1366−67 (Fed. Cir. 2008); *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1347–48 (Fed. Cir. 1999).

[82] *See* '516 patent at 4:35−44; 5:13−15; 6:15−22; 9:3−31; 12:44−58; and 18:6−16.

[83] *See* Wicker Decl. at ¶¶ 87−88 (Ex. 23).

provides some standard for measuring that degree." *Seattle Box Co. v. Indus. Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984). If the specification fails to provide such a standard and the claim is insolubly ambiguous, then the claim is indefinite. *E.g.*, *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347−49, 1356 (Fed. Cir. 2005).

The specification teaches that certain *networks* lack robustness due to problems such as packet duplication, "pollution," bottlenecks, and connectivity problems, all of which make it more difficult to maintain communications with the network "under adverse conditions." ('516 patent at 2:35−65.) The specification goes on to state that a robust *network* is simply one where a client can choose from and use multiple transmission paths to communicate information. (*See id.* at 3:17−23 (stating that the PRNET system "allows digital information to be transmitted in a more robust and efficient matter" because "digital data can follow multiple paths to a server that may include one or more clients of the network"); *see also id.* at 4:39−48; 6:18−25; 9:26−45.) These teachings about *network* robustness generally, however, do not shed light on how to determine which *transmission path* is the path through the most "robust" clients.[84]

Indeed, the specification only teaches how to identify the least-hops path from a client to a server/gateway.[85] The specification also says that this least-hops path should generally be the *most robust* path as well, "on the theory that the fewer the number of hops, the better the performance of the network." ('516 patent at 5:11−16.) The specification does not provide any other meaningful guidance on how to identify the path through the most "robust" clients, instead vaguely stating that optimization may result in routing messages around "less robust or slower links, even though it may increase the number of hops … ." (*Id.* at 9:16−20.)

The PTO agreed during prosecution of the related patent application SN 09/492,933 that

[84] Wicker Decl. at ¶¶ 87−88 (Ex. 23).

[85] '516 patent at, *e.g.*, 21:1−54 and Fig. 18; *see also* Wicker Decl. ¶ 82 (Ex. 23).

this claim phrase and the term "more robust" were indefinite. The '933 application was another divisional of the '062 parent application.[86] Claims 15 and 27 of that application recited the same element at issue here, in which "the optimal path" is "chosen from the group" that included, *inter alia*, "the path … through the most robust additional clients."[87] The PTO rejected these claims 15 and 27 as indefinite, stating:

> Claims 15 and 27 are rejected under 35 U.S.C. 112 second paragraph, as being indefinite … . [T]he phrase "more robust" renders the claim indefinite because it is unclear what limitations follow from the phrase since "robust" is a subjective term. Even though "robust" is defined in the specification on page 3 lines 12-13, the definition fails to objectively define the phrase since it fails to define what adverse conditions are.[88]

The applicant never responded to or disputed the PTO's indefiniteness rejection, instead abandoning the '933 patent application.[89]

The indefiniteness of this phrase is further demonstrated by IPCO's alternative construction, which defines a "robust" client as "the most reliable clients of those having the greatest ability to maintain communication under adverse conditions," listing non-exclusive factors such as "signal strength, battery life, link quality, and susceptibility to malfunctions." This results in a completely subjective definition of which path is through the most robust clients. As one very simple example under IPCO's definition, assume two transmission paths:

> Path #1, in which the clients have a stronger signal strength and battery life, but they also have a lesser link quality and malfunction more frequently.
>
> Path #2, in which the clients have a lesser signal strength and battery life, but they also have a stronger link quality and malfunction less frequently.

Which is "the path to the gateway through the most robust clients"? There is no objective way to

[86] *See* '933 Application PTO Bib Data Sheet at 1 (Ex. 16).

[87] Aug. 22, 2001 Prelim. Am. at 3, 5 (Ex. 17).

[88] Sept. 10, 2002 Office Action at 3 (Ex. 18).

[89] *See* Feb. 23, 2005 Notice of Abandonment (Ex. 19).

make this determination, and no guidance on how to do so from the specification. *See Datamize, LLC*, 417 F.3d at 1347−49, 1356 (holding the claim term "aesthetically pleasing" was subjective and indefinite). This is just one simple example; according to the specification, a real network can have *dozens* of clients and *hundreds* of potential paths.

Finally, many of the "robustness" factors IPCO identifies do not relate to which *client* is most robust as the claim recites, but instead which *transmission path* or *link* is the most robust. Metrics such as "signal strength" and "link quality" are affected by factors such as transmission distance, interference from other wireless devices, and atmospheric conditions. These metrics do not necessarily indicate whether a client is more or less robust, and equally robust clients may nonetheless have different signal strengths or link qualities. The claim language requires that the path be through the most robust client, and not simply through the most robust transmission path.

3. "The path to the gateway through the fastest clients"

Sensus's Position	IPCO's Position
Indefinite.	Claim construction is unnecessary; the plain and ordinary meaning controls. Alternatively, "the path to the gateway through the clients having the highest packet transmission and/or computing speed."

Similar to which clients are the most "robust" and what is the path through the "most robust additional clients," there is no accepted meaning of what client is "fastest" or any guidance from the specification on how to identify the path through the fastest clients. From the claim language and specification, it is unclear what is meant by the "fastest client." Is this the client having the fastest computing speed or highest packet transmission speed, as IPCO argues, or some other "speed" metric? As Dr. Wicker explains, computing speed and highest packet transmission speed are two very different things.[90]

Even assuming one could determine what is meant by an individual client being "fastest,"

[90] *See* Wicker Decl. at ¶ 86 (Ex. 23).

there is still no way to objectively identify the *path* through the "fastest clients," particularly when there may be dozens of clients and hundreds of paths. Once again, the specification provides no guidance, instead stating only that some radio links "may be slower than other links," such that optimization may involve routing data around these slower links.[91]

IPCO argues this term is nonetheless definite because a person of ordinary skill in the art would understand when one client is "faster" than another. The problem with IPCO's position, however, is the claim term in dispute is not the "fastest client," but "the *path* to the gateway *through* the fastest clients." Even assuming one could identify which clients, alone, are "fastest," there is still no guidance in the specification (or argument in IPCO's brief) about what is meant by the *path* to the gateway *through* the fastest clients or how to identify this path. Without any guidance from the specification of how to identify this path, this claim term is also indefinite.

4. "The path to the gateway through the clients with the least amount of traffic"

Sensus's Position	IPCO's Position
Indefinite.	Claim construction is unnecessary; the plain and ordinary meaning controls. Alternatively, "the path to the gateway through the clients having the lowest volume of packets transmitted through the client per unit time."

The specification also fails to explain how to identify "the path to the gateway through the clients with the least amount of traffic." Again, IPCO argues this term cannot be indefinite because the individual term "traffic" is well understood. IPCO fails to appreciate that the claim term in dispute is not what is meant by "least traffic," but what is meant by—and how to identify—the *path* through the clients having the least traffic. Another simple example exposes the definiteness problem posed by this term of degree:

> Path #1, in which there are two clients, each that transmit and receive 10Mb/s of data packet "traffic."

[91] *See* '516 patent at 9:15−20.

> Path #2, in which there are two clients, one of which transmits and receives 1Mb/s of data packet "traffic," and the other of which transmits and receives 100Mb/s of data packet "traffic."

Which of these paths is "the path to the gateway through the clients with the least amount of traffic" as the claim recites? It is not clear. Path 1 has less aggregate traffic (20Mb/s) than path 2 (101Mb/s), but path 2 has the client having the least amount of traffic (1Mb/s). And this very simple example involves only two-node paths and assumes, contrary to reality, that the amount of "traffic" through a particular client will remain relatively constant over time. The specification does not instruct a person of ordinary skill in the art how to identify and determine which path is the path having the least amount of traffic, (*see* Ex. 1 at 5:16−18; 9:12−15; 12:37−51; and 18:3−13), rendering this phrase indefinite too.

* * * * *

As discussed above, the specification only describes and supports optimization performed by least-hops routing. It does not describe how to identify any *paths* through the clients with the least amount of traffic, fastest clients, or most robust clients, including how to do so under realistic conditions as the amount of traffic, speed, and robustness of each client is changing; when there are dozens of clients and hundreds of links; and as other network conditions change including where the clients are joining, leaving, and moving about the network. Moreover, the specification also fails to resolve what is an "optimal route" when these different standards conflict: What if a route having more hops is nonetheless faster? What if a faster route has more traffic? What if the route having the least traffic is not "robust"? Plainly, not all of these routes can be "optimal"; the specification essentially teaches that once one departs from least-hops routing, what is "optimal" is in the eye of the beholder. (*See* '516 patent at 9:6−25.) Such a subjective definition of "optimal" cannot satisfy § 112 ¶ 2, and as a result '516 patent claims 1 and 15 are indefinite.

5. Mixed apparatus and method claims of '516 patent claims 1 and 15

Sensus's position	IPCO's position
'516 patent claims 1 and 15 are indefinite	Unknown.[92]

'516 patent claims 1 and 15 are indefinite because they impermissibly mix two distinct classes of statutory subject matter: an apparatus and a method. '516 patent claim 1 is exemplary and purports to recite an apparatus, "A server providing a gateway between two networks … ." ('516 patent at 23:20−22). Claim 1 goes on to recite three elements of the claimed apparatus: (1) "a radio modem …" (*id.* at 23:23−25); (2) "a network interface …" (*id.* at 23:26−27); and (3) "a digital controller …" (*id.* at 23:29−43). However, claim 1 goes on to recite a fourth element that is a method step and recites a particular *use* of the server apparatus, by requiring the digital controller element (and, hence, the recited server as a whole) to perform the action of "chang[ing] the transmission paths of clients to optimize the transmission paths … ." (*Id.* at 23:44−53.) '516 patent claim 15 similarly recites an apparatus including a digital controller, but its last element is a method step "wherein said digital controller changes the transmission paths of clients to optimize the transmission paths … ." (*Id.* 25:47−26:23.)

The recitation of this final method step in these claims, which must be performed by a user and depends on the use of the recited apparatuses renders '516 claims 1 and 15 invalid. In *IPXL Holdings v. Amazon.com*, the Federal Circuit found claim 25 of U.S. Patent No. 6,149,055 indefinite because it purported to recite both an "electronic financial transaction system …" and a method for using that system "to either change the predicted transaction information or accept the displayed transaction type and transaction parameters." 430 F.3d 1377, 1383−84 (2005). The Federal Circuit held that this mixing of apparatus and method subject matter rendered the

[92] Sensus notified IPCO prior to claim construction that Sensus intended to brief this issue during the Markman process. (*See* April 22, 2010 Letter from K. Davis to R. Walsh) (Ex. 20.) Nonetheless, IPCO did not address this issue in its opening Markman brief, so Sensus is not aware of IPCO's position on this issue.

claim indefinite because:

> Thus, it is unclear whether infringement of claim 25 occurs when one creates a system that allows the user to change the predicted transaction information or accept the displayed transaction, or whether infringement occurs when the user actually uses the input means to change transaction information or uses the input means to accept a displayed transaction. Because claim 25 recites both a system and the method for using that system, it does not apprise a person of ordinary skill in the art of its scope, and it is invalid under section 112, paragraph 2.

The same situation that existed in *IPXL Holdings* is present here for '516 patent claims 1 and 15. IPCO has accused Sensus electric meters having a ZigBee radio of infringement, alleging that each meter's ZigBee radio optimizes transmission paths when the meter is part of a wireless ZigBee network also having in-home ZigBee devices, such as a "smart" thermostat or display inside a residence having a ZigBee radio.[93] Because of the last method step that requires "chang[ing] the transmission paths of clients to optimize the transmission paths," Sensus's alleged infringement depends not solely on the design of its meters, but also whether and how users install and use those meters in a ZigBee network system.[94] If Sensus's meters are not used with in-home ZigBee devices (thermostats or displays), or if the network remains static, then the meter will not "change[] the transmission paths" to in-home ZigBee devices, which is the last element of '516 patent claims 1 and 15. It is unclear whether Sensus infringes when a ZigBee network is created having Sensus meters and other ZigBee devices, versus how Sensus's meters are actually used in a particular ZigBee system. This renders claims 1 and 15 indefinite.[95]

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[93] *See* Attachment B to IPCO's P.R. 3-1 Infringement Contentions at, e.g., 2−3 (Ex. 21.)

[94] Notably, claim 1 does not recite that the digital controller is merely be capable of changing the transmission path, nor is the concluding method step part of a preamble or § 112 ¶ 6 functional language. *See Microprocessor Enhancement Corp. v. Texas Instruments Inc.*, 520 F.3d 1367, 1374−76 (Fed. Cir. 2008). Further, the patentee was aware of the distinction between claiming structure capable of performing a function—as stated for the "radio modem" and "network interface" elements earlier in claim 1 that need only be "capable of communicating …" (*id.* at 23:23−28)—in contrast to the concluding method step that requires the actual act of "chang[ing] the transmission paths of clients to optimize the transmission paths … ." (*Id.* at 23:44−53.)

[95] *See id.; see also Ariba, Inc. v. Emptoris, Inc.*, 2008 WL 3482521, at *6−*8 (E.D. Tex. Aug. 7, 2008) (Clark, J.) (finding claim reciting a "bidding device" invalid under *IPXL Holdings* because "one of the key elements of [the claim] is a method step that is conducted by some person or system other than the claimed device").

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Respectfully submitted,

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CERTIFICATE OF SERVICE

I certify that this document was filed electronically pursuant to Local Rule CV-5(a) on June 23, 2010. Pursuant to Local Rule CV-5(a)(3)(A), this electronic filing acts to electronically serve all counsel who have consented to electronic service via the Court's CM/ECF system.

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